

CLAIMS

1. A diode laser comprising:

- 5 a. a plurality of semiconductor layers including a top layer, a bottom layer, and
an intermediate emission layer, the top layer including a ridge formed on a top
surface thereof and extending to a first edge of the top layer, the layers each
having a refractive index associated therewith, the refractive index of the
emission layer differing from the refractive indices of the top and bottom
10 layers;
- b. a dopant region associated with the ridge and conforming in shape thereto;
- c. means facilitating application of an electric field through the layers, the electric
field altering the refractive indices of the layers, the degree of alteration
15 differing within a confinement region defined by the ridge, radiation generated
within the emission layer being optically confined within the confinement
region and emitted from a first edge of the emission layer;

wherein

- d. the ridge comprises an elongated segment and a flared segment extending to
the first edge, the flared segment comprising at least two opposed grooves in
20 a surface thereof, the grooves suppressing multimode radiation.

2. The diode laser of claim 1 wherein the ridge contains a dopant material, and further comprising a dopant material on an exposed surface of the bottom layer in a pattern identical in shape to the ridge.

5 3. The diode laser of claim 1 wherein the means facilitating application of an electric field is a pair of metal contacts on the top and bottom layers.

4. The diode laser of claim 1 wherein the ridge acts as a waveguide and the elongated segment has a width that permits only a single mode of light to propagate therethrough.

10 5. The diode laser of claim 1 wherein the flared segment has a pair of opposed side edges, the grooves extending from each side edge in a direction perpendicular to the edge.

15 6. The diode laser of claim 1 wherein the flared segment comprises a single pair of grooves.

7. The diode laser of claim 1 wherein the flared segment comprises three pairs of grooves.

20 8. The diode laser of claim 1 wherein the flared segment comprises five pairs of grooves.